

REMARKS

In light of the following remarks, reconsideration of the present application is respectfully requested. Claims 1-3, 6, 8-15, 17-18 and 21-23 are pending. Claims 1 and 15 are amended. Support for the amended claims may be found in paragraph [0022] of the specification, for example. No new matter has been added.

Applicants wish to thank the Examiner for his time during the telephonic interview of December 14, 2009. During the interview, Applicants and the Examiner discussed the merits of claim 1 relative to surface matching a 3D surface profile from 3D image data to a 3D surface profile. In more detail, Applicants primarily set forth arguments commensurate with those shown below. At the conclusion of the interview, the Examiner agreed that the references do not disclose surface matching wherein the 3D image data are high resolution data. Moreover, the Examiner agreed that Packer fails to disclose a multi-stage registration process. Accordingly, Applicants have amended independent claims 1 and 15 to clarify that the 3D image data are high resolution image data. Therefore, Applicants respectfully request that the Examiner withdraw the rejections of claims 1-3, 6, 8-15, 17-18 and 21-23.

Rejections under 35 U.S.C. § 103¹

1. Claims 15, 22, 1-3, 9-10 and 14 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Packer et al. (US 6,556,695), hereinafter "Packer," in view of Leiper (US 6,128,002). Applicants traverse this rejection.

Claim 15 requires, inter alia, surface matching a 3D surface profile from 3D image data to a 3D surface profile from 3D mapping data, with the "3D image data

¹ To be thorough, further expedite prosecution, and for the sake of clarity, Applicants provide discussions of each of the references separately, however, Applicants are not attacking these references individually, but arguing that the references, even taken in

being high resolution image data." At least this feature is not disclosed or suggested by Packer, Leiper or a combination of the two (assuming they could be properly combined, which Applicants do not admit).

Packer discloses a method for producing high resolution real-time images. The method includes registering a high resolution model with an acquired real-time low resolution image. As disclosed in col. 8, lines 22-27,

the ultrasonic image data is input to a real-time imaging system 39 which uses the real-time ultrasound image data, the high resolution model of the patient's heart stored in memory 37 and an ECG signal from the patient to produce real-time images which are output through cable 60 to a display 61.

The ultrasonic image data is low resolution image data.² Location of mapping basket electrodes 268 are detected in the ultrasonic images and registered with high resolution image data.

The Examiner relies on the ultrasonic image data to teach the "3D image data" of claim 15. However, the ultrasonic image data, which is registered with the selected high resolution image, is not high resolution data. By contrast, the ultrasonic image data of Packer is low resolution data. Moreover, Packer teaches away from the use of high resolution data. "Convergence to this result is speeded by beginning with low resolution versions of both images."³

Accordingly, Packer fails to disclose or suggest the surface matching a 3D surface profile from 3D image data to a 3D surface profile from the 3D mapping data, with the "3D image data being high resolution image data," as required by claim 15.

Even assuming for the sake of argument that Packer and Leiper could be properly combined (which Applicants do not admit), Leiper fails to cure the above-discussed deficiencies of Packer. Therefore, claim 15 is not rendered obvious by

combination, fail to render the claimed invention obvious because all features of the claims are not found in the prior art.

Packer and Leiper. Claim 22, which is dependent on claim 15, is patentable for at least the reasons set forth above.

Claim 1 is a separate independent claim from claim 15, wherein claim 1 contains its own individual limitations. Each independent claim should be interpreted solely based upon limitations set forth therein. However, claim 1 is patentable for at least reasons somewhat similar to those set forth above regarding claim 15. Claims 2-3, 9-10 and 14 are patentable based at least on their dependency on claim 1.

Therefore, Applicants respectfully request that the rejections of claims 15, 22, 1-3, 9-10 and 14 under 35 U.S.C. § 103 be withdrawn.

2. Claims 17-18, 21, and 6 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Packer in view of Hemler et al. (A System for Multimodality Image Fusion), hereinafter “Hemler,” and further in view of Williams et al. (DE 19953308-A1), hereinafter “Williams.”

The Examiner correctly acknowledges that the features of claims 17-18, 21, and 6 are absent from Packer, but alleges that these features are taught by Hemler and Williams, thereby rendering claims 17-18, 21, and 6 obvious to one of ordinary skill at the time of the invention. Even assuming *arguendo* that the features of claims 17-18, 21, and 6 are taught by Hemler and Williams (which Applicants do not admit) and that Hemler and Williams could be properly combined with Packer (which Applicants do not admit), Packer, Hemler and Williams are still deficient with respect to the above-described features of claims 15 and 1. Thus, even in combination, Packer, Hemler and Williams fail to render claims 17-18, 21, and 6 obvious.

² See generally, col. 10, lines 2-5 of Packer.

³ Id.

Claim 6

In addition to the arguments presented above, Applicants submit additional arguments regarding claim 6.

Claim 6 requires, *inter alia*, a multi-stage registration wherein “correlation with the correct position and dimension is effected automatically in a first stage during the performance of the catheter application by way of at least one of distinct anatomical points and artificial markers and is refined by the surface matching in a later second stage.” At least this feature is not disclosed or suggested by Packer, Hemler, Williams or a combination of the three (assuming they could be properly combined, which Applicants do not admit).

MPEP § 2143.01(VI) provides, “if the proposed modification or combination of the prior art would change the principle of operation of the prior art invention being modified, then the teachings of the references are not sufficient to render the claims *prima facie* obvious.”

As admitted by the Examiner, Packer fails to disclose a multi-stage registration process.

Hemler discloses a system for image fusion. The system builds 3D surfaces from a stacked set of 2D boundaries. The registration process minimizes the total squared distance between the surfaces of similar anatomic structures. Hemler, like Packer, discloses a single-stage registration process.

Williams discloses an image system having a generator that aligns images with registration markers of corresponding cells. However, Williams fails to disclose or suggest a multi-stage registration process.

However, the Examiner contends that it would have been obvious to provide the registrations of Williams and Hemler to the registration of Packer. Applicants disagree.

Hemler teaches a single-stage registration process based on a stacked set of 2D boundaries. Williams teaches a single-stage registration process based on a generator that aligns images with registration markers of corresponding cells. And, Packer fails to disclose a multi-stage registration process. Neither Packer, Hemler, or Williams discloses or suggests a multi-stage registration process. Instead, one skilled in the art combining the teachings of Hemler and/or Williams to Packer would simply replace Packer's registration process.

Consequently, a combination of Packer, Hemler and Williams would not result in a multi-stage registration wherein "correlation with the correct position and dimension is effected automatically in a first stage during the performance of the catheter application by way of at least one of distinct anatomical points and artificial markers and is refined by the surface matching in a later second stage," as required by claim 6.

Therefore, Applicants respectfully request that the rejections of claims 17-18, 21, and 6 under 35 U.S.C. § 103 be withdrawn.

3. Claims 23 and 13 stand rejected under 35 U.S.C. § 103(a) as being unpatentable over Packer in view of Leiper and further in view of Hughes et al. (US 7,233,340), hereinafter "Hughes."

The Examiner correctly acknowledges that the features of claims 23 and 13 are absent from Packer and Leiper, but alleges that these features are taught by Hughes, thereby rendering claims 23 and 13 obvious to one of ordinary skill at the time of the invention. Even assuming *arguendo* that the features of claims 23 and

13 are taught by Hughes (which Applicants do not admit) and that Hughes could be properly combined with Packer and Leiper (which Applicants do not admit), Packer, Leiper and Hughes are still deficient with respect to the above-described features of claims 15 and 1. Thus, even in combination, Packer, Leiper and Hughes fail to render claims 23 and 13 obvious.

Therefore, Applicants respectfully request that the rejections of claims 23 and 13 under 35 U.S.C. § 103 be withdrawn.

4. Claim 8 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Packer in view of Leiper and further in view of Schweikard et al. (US 6,144,875), hereinafter “Schweikard.”

The Examiner correctly acknowledges that the features of claim 8 are absent from Packer and Leiper, but alleges that these features are taught by Schweikard, thereby rendering claim 8 obvious to one of ordinary skill at the time of the invention. Even assuming *arguendo* that the features of claim 8 are taught by Schweikard (which Applicants do not admit) and that Schweikard could be properly combined with Packer and Leiper (which Applicants do not admit), Packer, Leiper and Schweikard are still deficient with respect to the above-described features of claim 1. Thus, even in combination, Packer, Leiper and Schweikard fail to render claim 8 obvious.

Therefore, Applicants respectfully request that the rejection of claim 8 under 35 U.S.C. § 103 be withdrawn.

5. Claim 11 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Packer in view of Leiper and further in view of Krishnan (US 6,771,262).

The Examiner correctly acknowledges that the features of claim 11 are absent from Packer and Leiper, but alleges that these features are taught by

Krishnan, thereby rendering claim 11 obvious to one of ordinary skill at the time of the invention. Even assuming *arguendo* that the features of claim 11 are taught by Krishnan (which Applicants do not admit) and that Krishnan could be properly combined with Packer and Leiper (which Applicants do not admit), Packer, Leiper and Krishnan are still deficient with respect to the above-described features of claim 1. Thus, even in combination, Packer, Leiper and Krishnan fail to render claim 11 obvious.

Therefore, Applicants respectfully request that the rejection of claim 11 under 35 U.S.C. § 103 be withdrawn.

6. Claim 12 stands rejected under 35 U.S.C. § 103(a) as being unpatentable over Packer et al. in view of Leiper and further in view of Massaro et al. (US 2002/0087329), hereinafter "Massaro."

The Examiner correctly acknowledges that the features of claim 12 are absent from Packer and Leiper, but alleges that these features are taught by Massaro, thereby rendering claim 12 obvious to one of ordinary skill at the time of the invention. Even assuming *arguendo* that the features of claim 12 are taught by Massaro (which Applicants do not admit) and that Massaro could be properly combined with Packer and Leiper (which Applicants do not admit), Packer, Leiper and Massaro are still deficient with respect to the above-described features of claim 1. Thus, even in combination, Packer, Leiper and Massaro fail to render claim 12 obvious.

Therefore, Applicants respectfully request that the rejection of claim 12 under 35 U.S.C. § 103 be withdrawn.

CONCLUSION

In view of the above remarks and amendments, the Applicants respectfully submit that each of the pending objections and rejections has been addressed and overcome, placing the present application in condition for allowance. A notice to that effect is respectfully requested. If the Examiner believes that personal communication will expedite prosecution of this application, the Examiner is invited to contact the undersigned.

Pursuant to 37 C.F.R. §§ 1.17 and 1.136(a), Applicant(s) hereby petition(s) for a one (1) month extension of time for filing a reply to the outstanding Office Action and submit the required \$130.00 extension fee herewith.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Donald J. Daley at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 08-0750 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

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